REMARKS

Claims 105-108 and 110-149 are pending.

Claims 136 and 138 were rejected under 35 USC §112, first paragraph, as allegedly failing to comply with the enablement requirement. Claims 136 and 138 have been amended to clarify that the secondary optical system in the first row and the secondary optical system in the second row are disposed in the opposite direction with each other. Favorable reconsideration of the rejection is earnestly solicited.

Claims 113 and 115 were rejected under 35 USC §112, second paragraph, as being indefinite. Claim 113 has been amended to depend from claim 105. Furthermore, claim 115 does not include the phrase "of irradiation" as set forth in the Office Action. Favorable reconsideration is earnestly solicited.

Claims 114, 132, 135 and 141 were rejected under 35 USC §102(b) as being anticipated by Nakasuji. Favorable reconsideration of this rejection is earnestly solicited.

Claim 114 requires that the plurality of the charged particle beams are irradiated each at a position separated larger than a distance resolution of the secondary optical system, which is a method for preventing cross talk among the multi-beams by forming the beam distance larger than a distance resolution of the secondary optical system. It is respectfully submitted that Nakasuji fails to teach or suggest the features of claim 114, even though the Examiner characterized Nakasuji as teaching that the positions at which the plurality of the charged particles are irradiated are separated enough that the secondary charged particles generated by each beam will only be incident on the detector designated for that beam.

Claim 132 has been amended to be dependent upon claim 131. In claim 131, beams are formed in rows N and in columns M in a two dimensional way on an optical axis. As such, it is possible to form a plurality of beams on a wafer and to make it with lower cost due to one optical axis. It is respectfully submitted that Nakasuji fails to teach or suggest such features as set forth in claims 132 and 135.

Claim 141 has been amended to highlight the advantageous effects associated with the beams being disposed nearby the optical axis which decreases aberration, and that the beams are two-dimensionally disposed which enables arrangement of a large number of beams.

Claim 105 was rejected under 35 USC §102(b) as anticipated by or, in the alternative, under 35 USC §103(a) as obvious over Nakasuji. This rejection has been rendered moot by the amendment incorporating the features of claim 109 into claim 105.

Claims 106-108 and 111 were rejected under 35 USC §103(a) as being unpatentable over Nakasuji in view of Lo et al. This rejection has also been rendered moot by the amendment of claim 105.

Claims 110 and 112 were rejected under 35 USC §103(a) as being unpatentable over Nakasuji and Lo et al. and further in view of Davis et al. This rejection has also been rendered moot by the above amendment.

Claims 114, 120-123 and 142 were rejected under 35 USC §102(b) as being anticipated by Honjo et al. Favorable reconsideration of this rejection is earnestly solicited.

Honjo et al. does not teach the feature that the plurality of the charged particle beams are irradiated each at a position separated larger than a distance resolution of the secondary optical system, i.e., a method for preventing cross talk among the multi-beams by forming the beam

distance larger than a distance resolution of the secondary optical system. Favorable reconsideration is earnestly solicited.

Claims 109, 116-119, 124-131, 134, 140 and 143-147 were rejected under 35 USC §103(a) as being unpatentable over Nakasuji in view of Brunner et al. Favorable reconsideration of this rejection is earnestly solicited.

In an inspection apparatus comprising a primary and secondary electronic optical systems, if primary and secondary beams travel a long distance in parallel, they increase beam blurs with each other due to the space charge effect and, therefore, it is preferable to shorten the distance where primary and secondary beams co-exist. In a practical way, it is possible to make the distance shortest by positioning the E x B separator between an objective lens and a lens at the side of a beam source. Nakasuji teaches a method for irradiating beams in an oblique direction, however, which is not practical since it includes problems such as the beam becomes an ellipse shape, etc. Brunner et al. does not disclose any structure to make the distance shortest by positioning the E x B separator between an objective lens and a lens at the side of a beam source.

Amended claim 124 includes the feature "wherein secondary charged particles are separated from the primary charged particle beams after they pass through the objective lens before they enter to the next lens". In order to adjust the beams, it is important to minimize the number of lenses through which both the primary and the secondary beams pass, since change of conditions of any lens to adjust the focus of the primary beam affects the focus of the secondary beam. In order to make number of lenses through which both the primary and the secondary beams pass to zero, it is necessary to irradiate the primary beam obliquely, which will cause larger problems. Amended claim 124 describes the best solution.

Amended claim 125 includes the feature that at least one stage lens is disposed "between the E x B separator and the detectors". Brunner et al. does not use "at least one stage lens" defined in amended claim 125, and there happens that focus of the secondary beam deviates if the primary beam is focalized. On the other hand, if the secondary beam is focalized, the focus of the primary beam deviates. To the contrary, if there is a lens as provided in claim 125, when the focus of the secondary beam deviates by focalizing of the primary beam, it is possible to focalize the secondary beam without affecting the primary beam.

Amended claim 126 includes the feature "a primary optical system having a beam source with an integrated cathode with multiple emission areas". This feature is not obvious from Nakasuji or Brunner et al.

Claim 127 recites the feature "the position of the single aperture plate in the direction of the optical axis thereof is disposed so as to minimize the difference in beam strength of the beams to be delivered from each aperture to the surface of the sample". This feature is not described nor obvious from Nakasuji or Brunner et al. In order to inspect defects in a wafer by using multi-beams, it is very important that beam strength of multi-beam is substantially equal.

Claim 128 provides the feature "wherein an amount of deviation is set so that a difference between an amount of detection of the secondary charged particles obtained for the plurality of the apertures is minimized when a sample with no pattern is disposed on a surface of the sample". This feature is not described or obvious from Nakasuji or Brunner et al.

Claim 130 recites the feature "the positions of the plurality of the apertures are disposed so as to correct a distortion of the primary optical system". The feature defined in claim 130 is not described or obvious from Nakasuji or Brunner et al. The Examiner states at page 5 lines 1-4 of the Action that Nakasuji (lines 38-41 in column 11) teaches to form the beam shaping apertures as ellipses in order to generate circular beams. However, Nakasuji relates to forming the beam shaping apertures themselves while claim 130 relates to the positions of the apertures which is different from Nakasuji.

As to claim 131, the art discloses beams disposed in rows N and in columns M. However, the rows N and columns M are not on one optical axis, and include optical axes disposed in rows N and in columns M wherein there is only one beam on one optical axis. The number of beams must be increased in order to increase the through-put in an inspection apparatus. In a method to increase the number of optical axes to increase the number of beams, the number of optical axes which can be arranged on one wafer is limited since one optical axis actually has a finite size. Although there is an idea to form multiple optical axes using a silicon wafer, there is actually no example wherein beams are slenderized. In claim 131, since beams are formed in rows N and in columns M in two dimensional way on an optical axis, it is possible to form a plurality of beams on a wafer and to make it with low cost due to one optical axis.

Claims 133, 137, 139, 148 and 149 were rejected under 35 USC §103(a) as being unpatentable over Nakasuji and Brunner et al. further in view of Adamec. Favorable reconsideration of this rejection is earnestly solicited.

Claim 133 includes the feature "the images of the secondary charged particles are formed on a deflecting main plane of the E x B separator". This feature defined in claim 133 is not described or obvious from Nakasuji, Brunner et al. or Adamec. In designing in the above manner, there is an advantage that the images of the secondary charged particles has no chromatic aberration due to the E x B separator.

The Examiner states at page 12 lines 17-20 of the Action that "both electric fields and magnetic fields cause deflection of electron beams passing through them, it would have been obvious to a person having ordinary skill in the art that an additional electric field could be superimposed on the crossed electric and magnetic fields as easily as a magnetic field for scanning purposes". However, claim 137 is limited to the electric field, since in case of plurality of beams, the secondary charged particles are affected by a scan signal. If scan signals are given to the electric field of an E x B separator which is a deflector with a two-stage deflection, the secondary charged particles are deflected toward the optical axis which enables detection of the secondary charged particles. However, if an electromagnetic deflection signal is applied to the magnetic field, the secondary charged particles are deflected to the direction outward of the optical axis and detection of the secondary charged particles becomes very difficult. This fact will be understood by only a person who has investigated multi beams accurately.

Claim 149 includes the feature "a position of the image of the plurality of apertures is made to correspond to a position of the E x B separator" which has an advantageous effect that

the aberration generated in the E x B separator does not affect resolution of the primary beams. This feature is not shown in any of Nakasuji and Brunner et al., and Adamic.

For at least the foregoing reasons, the claimed invention distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

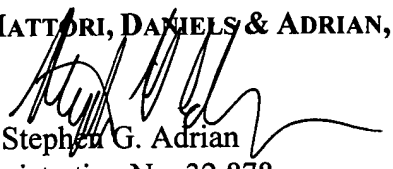
Should the Examiner deem that any further action by applicants would be desirable to place the application in condition for allowance, the Examiner is encouraged to telephone applicants' undersigned attorney.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



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